

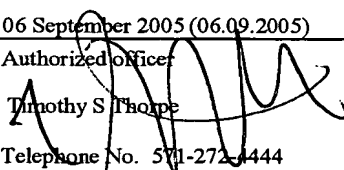
# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 100109-0001	FOR FURTHER ACTION		See Form PCT/IPEA/416																
International application No. PCT/US04/00641	International filing date (day/month/year) 12 January 2004 (12.01.2004)	Priority date (day/month/year) 10 January 2003 (10.01.2003)																	
International Patent Classification (IPC) or national classification and IPC IPC(7): F02C 3/14 and US Cl.: 60/39.35																			
Applicant KEOGH, RORY																			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table style="margin-left: 20px; border: none;"> <tr> <td><input checked="" type="checkbox"/> Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/> Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/> Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/> Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/> Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/> Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>				<input checked="" type="checkbox"/> Box No. I	Basis of the report	<input type="checkbox"/> Box No. II	Priority	<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/> Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement	<input type="checkbox"/> Box No. VI	Certain documents cited	<input type="checkbox"/> Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/> Box No. VIII	Certain observations on the international application
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Date of submission of the demand 09 August 2004 (09.08.2004)		Date of completion of this report 06 September 2005 (06.09.2005)																	
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer  Timothy S. Thorpe Telephone No. 571-272-4444																	

Form PCT/IPEA/409 (cover sheet) (January 2004)

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☒ the description:  
pages 1-20 \_\_\_\_\_ as originally filed/furnished  
pages\* NONE \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* NONE \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:  
pages 21-23 \_\_\_\_\_ as originally filed/furnished  
pages\* NONE \_\_\_\_\_ as amended (together with any statement) under Article 19  
pages\* NONE \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* NONE \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:  
pages 1-12 \_\_\_\_\_ as originally filed/furnished  
pages\* NONE \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* NONE \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US04/00641**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims <u>2,4,5,7-10,12,13,20,21-23,26</u>	YES
	Claims <u>1,3,6,11,14-19,24,25</u>	NO
Inventive Step (IS)	Claims <u>22,23</u>	YES
	Claims <u>1,3,6,11,14-19,24,25</u>	NO
Industrial Applicability (IA)	Claims <u>1-26</u>	YES
	Claims <u>NONE</u>	NO

**2. Citations and Explanations (Rule 70.7)**  
Please See Continuation Sheet

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/00641

**Box No. VIII** Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 9 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim 9 is indefinite for the following reason(s): Claim 9 recites "a secondary impeller" without first positively reciting a "first or primary impeller" either on claim 1 from which this claim depends or on the same claim 9. Appropriate correction is required.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

V. 2. Citations and Explanations:

1. Claims 1, 3, 6, 14, 16-18 and 24 lack novelty under PCT Article 33(2) as being anticipated by Call (U.S. 3,417,564).

With respect to claim 1, Call teaches a gas turbine engine comprising: a rotating combustion system 23, 25; and a rotating turbine system 28, wherein the rotating combustion system 23, 25 is operatively connected (through a shaft) to the rotating turbine system 28 thereby forming a single rotating assembly, which rotates about a common axis (axis of the gas turbine engine). See particularly Figure 2 of Call.

With respect to claim 3, Call teaches that the gas turbine engine further comprises an upstream compressor 17. See particularly Figure 2 of Call.

With respect to claim 6, Call teaches that the combustor and turbine operate in a radially outflow configuration. See particularly Figure 2 of Call.

With respect to claim 14, Call teaches that the gas turbine engine comprises an ignition system (inherent) for igniting a fuel/air mixture.

With respect to claim 16, Call teaches that the single rotating component operates as a multi-stage gas turbine 27, 28. See particularly Figure 2 of Call.

With respect to claim 17, Call teaches that the turbine comprises at least one additional axial or radial compressor stage 14 upstream of the single rotating component. See particularly Figure 2 of Call.

With respect to claim 18, Call teaches that the turbine comprises at least one additional axial or radial turbine stage 27 downstream of the single rotating component. See particularly Figure 2 of Call.

With respect to claim 24, Call teaches a gas turbine comprising: a rotating combustion system 23, 25; a radial impeller 17 operatively coupled to the rotating combustion system; and a rotating turbine nozzle 28 having rotating blades, wherein the rotating combustion system remains geometrically fixed in relation to the radial impeller and turbine nozzle blades, all of which spin at a similar rate of rotation about a common axis of rotation. See particularly Figure 2 of Call.

## Supplemental Box

2. Claims 1, 3, 6, 14 and 24 lack novelty under PCT Article 33(2) as being anticipated by Onishi et al. (U.S. 3,469,396).

With respect to claim 1, Onishi teaches a gas turbine engine comprising: a rotating combustion system 2; and a rotating turbine system 3, wherein the rotating combustion system is operatively connected to the rotating turbine system thereby forming a single rotating assembly, which rotates about a common axis (axis of the gas turbine engine). See particularly Figure 1, column 1 lines 21-24, and column 3 lines 4-9 of Onishi.

With respect to claim 3, Onishi teaches that the gas turbine engine further comprises an upstream compressor 1. See particularly Figure 1 of Onishi.

With respect to claim 6, Onishi teaches that the combustor and turbine operate in a radially outflow configuration. See particularly Figure 1 of Onishi.

With respect to claim 14, Onishi teaches that the gas turbine engine comprises an ignition system (inherent) for igniting a fuel/air mixture.

With respect to claim 24, Onishi teaches a gas turbine comprising: a rotating combustion system 2; a radial impeller 1 operatively coupled to the rotating combustion system; and a rotating turbine nozzle 3 having rotating blades, wherein the rotating combustion system remains geometrically fixed in relation to the radial impeller and turbine nozzle blades, all of which spin at a similar rate of rotation about a common axis of rotation. See particularly Figure 1, column 1 lines 21-24, and column 3 lines 4-9 of Onishi.

3. Claims 1, 3, 6, 14 and 24 lack novelty under PCT Article 33(2) as being anticipated by Campbell (U.S. 3,557,551).

With respect to claim 1, Campbell teaches a gas turbine engine comprising: a rotating combustion system 20; and a rotating turbine system 28, wherein the rotating combustion system is operatively connected to the rotating turbine system thereby forming a single rotating assembly, which rotates about a common axis (axis of the gas turbine engine). See particularly Figure 2, and column 3 lines 47-48 of Campbell.

With respect to claim 3, Campbell teaches that the gas turbine engine further comprises an upstream compressor 14, 16. See particularly Figure 2 of Campbell.

With respect to claim 6, Campbell teaches that the combustor and turbine operate in a radially outflow configuration. See particularly Figure 2 of Campbell.

With respect to claim 14, Campbell teaches that the gas turbine engine comprises an ignition system (inherent) for igniting a fuel/air mixture.

With respect to claim 24, Campbell teaches a gas turbine comprising: a rotating combustion system 20; a radial impeller 14, 16 operatively coupled to the rotating combustion system; and a rotating turbine nozzle 28 having rotating blades, wherein the rotating combustion system remains geometrically fixed in relation to the radial impeller and turbine nozzle blades, all of which spin at a similar rate of rotation about a common axis of rotation. See particularly Figure 2, and column 3 lines 47-48 of Campbell.

4. Claims 1, 3, 6, 11, 14, 19, 24 and 25 lack novelty under PCT Article 33(2) as being anticipated by Greer (U.S. 4,724,670).

With respect to claim 1, Greer teaches a gas turbine engine comprising: a rotating combustion system 73; and a rotating turbine system 107, 109, wherein the rotating combustion system is operatively connected to the rotating turbine system thereby forming a single rotating assembly, which rotates about a common axis (axis of the gas turbine engine). See particularly Figure 1B, column 5 lines 3-4, and column 5 lines 27-32 of Greer.

With respect to claim 3, Greer teaches that the gas turbine engine further comprises an upstream compressor 29. See particularly Figure 1B of Greer.

With respect to claim 6, Greer teaches that the combustor and turbine operate in a radially outflow configuration. See particularly Figure 1B of Greer.

With respect to claim 11, Greer teaches that the turbine further comprises a cooling system designed to cool the components of the gas turbine. See particularly Figure 1B, and column 2 lines 29-32 of Greer.

With respect to claim 14, Greer teaches that the gas turbine engine comprises an ignition system (inherent) for igniting a fuel/air mixture.

With respect to claim 19, Greer teaches that the gas turbine further comprises a counter-rotating turbine 113, 114, 115, 117

## Supplemental Box

operatively connected to said turbine 107, 109. See particularly Figure 1B, and column 5 lines 3-4 of Greer.

With respect to claim 24, Greer teaches a gas turbine comprising: a rotating combustion system 73; a radial impeller 29 operatively coupled to the rotating combustion system; and a rotating turbine nozzle 107, 109 having rotating blades, wherein the rotating combustion system remains geometrically fixed in relation to the radial impeller and turbine nozzle blades, all of which spin at a similar rate of rotation about a common axis of rotation. See particularly Figure 1B, column 5 lines 3-4, and column 5 lines 27-32 of Greer.

With respect to claim 25, Greer teaches that the gas turbine further comprises a counter-rotating turbine 113, 114, 115, 117. See particularly Figure 1B, and column 5 lines 3-4 of Greer.

5. Claims 1, 3, 6, 14, 15 and 24 lack novelty under PCT Article 33(2) as being anticipated by Zdvorak (U.S. 5,960,625).

With respect to claim 1, Zdvorak teaches a gas turbine engine comprising: a rotating combustion system 74; and a rotating turbine system 70, wherein the rotating combustion system is operatively connected to the rotating turbine system thereby forming a single rotating assembly, which rotates about a common axis (axis of the gas turbine engine). See particularly Figure 2A of Zdvorak.

With respect to claim 3, Zdvorak teaches that the gas turbine engine further comprises an upstream compressor 62. See particularly Figure 2A of Zdvorak.

With respect to claim 6, Zdvorak teaches that the combustor and turbine operate in a radially outflow configuration. See particularly Figure 2A of Zdvorak.

With respect to claim 14, Zdvorak teaches that the gas turbine engine comprises an ignition system (inherent) for igniting a fuel/air mixture.

With respect to claim 15, Zdvorak teaches that the ignition system comprises a spark ignition 88B. See particularly Figure 2A of Zdvorak.

With respect to claim 24, Zdvorak teaches a gas turbine comprising: a rotating combustion system 74; a radial impeller 62 operatively coupled to the rotating combustion system; and a rotating turbine nozzle 70 having rotating blades, wherein the rotating combustion system remains geometrically fixed in relation to the radial impeller and turbine nozzle blades, all of which spin at a similar rate of rotation about a common axis of rotation. See particularly Figure 2A of Zdvorak.

6. Claims 22 and 23 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest "a combustion system, wherein the combustion system is integrated into the rotating passages of the compressor/turbine single impeller".

7. Claims 2, 4, 5, 7-10, 12, 13, 20, 21 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 1-26 meet the industrial applicability as defined by PCT Article 33(4) because the invention can be used as a gas turbine engine.

----- NEW CITATIONS -----